

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application. The text of all pending claims is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~striketrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

LISTING OF CLAIMS:

1. (Currently Amended) A control and regulation system of a combustion unit including a combustion chamber and a catalyst, said control and regulation system comprising:

an acquisition device configured to acquire signals proportional to functioning parameters characteristic of the functioning state of the combustion unit;

an electronic data processing unit connected to the signal acquisition device and configured to receive the signals;

a control and regulation program associated with said electronic data processing unit;

a first fuel distribution valve configured to fluidly connect to the combustion chamber;

a second air distribution valve configured

to fluidly connect a first area of the combustion chamber to a third area of

the combustion chamber, and
to regulate an amount of air flowing to the third area from the first area
outside the combustion chamber; and
a data base associated with said electronic data processing unit, wherein
said electronic data processing unit receives the signals from the signal
acquisition device, processes the signals and, based on the processed signals and the
data base, regulates an opening of the first valve and second valve to minimize polluting
emissions of CO and NOx of the combustion unit.

2. (Previously Presented) The control and regulation system of a combustion unit according to claim 1, wherein said acquisition device comprises at least one sensor configured to detect at least one signal proportional to a functional parameter characteristic of the functioning state of the combustion unit.

3. (Previously Presented) The control and regulation system of a combustion unit according to claim 1, wherein said acquisition device comprises a series of sensors configured to detect signals proportional to parameters characteristic of the functioning state of the combustion unit.

4. (Previously Presented) The control and regulation system of a combustion unit according to claim 3, wherein said series of sensors comprises a set of temperature sensors.

5. (Previously Presented) The control and regulation system of a combustion unit according to claim 1, wherein said acquisition device includes a first set of temperature sensors, a second set of temperature sensors and a third set of temperature sensors.

6. (Previously Presented) The control and regulation system of a combustion unit according to claim 5, wherein said acquisition device comprises first pressure sensors disposed between a compressor configured to provide air to the combustion chamber and the combustion chamber and second pressure sensors disposed downstream from a turbine connected to the combustion chamber.

7. (Previously Presented) The control and regulation system of a combustion unit according to claim 5, wherein said acquisition device comprises first temperature sensors disposed between a compressor configured to provide air to the combustion chamber and the combustion chamber and second temperature sensors disposed downstream from a turbine connected to the combustion chamber.

8. (Previously Presented) The control and regulation system of a combustion unit according to claim 1, wherein said combustion chamber comprises the first area, a second area in which the catalyst is housed, the third area that sandwiches with the first area the second area, a first fuel inlet duct connecting said first fuel distribution valve to

said first area of the combustion chamber, a second inlet duct configured to transport the air coming from a compressor and an outlet duct of the exhaust gases that is connected to the third area of the combustion chamber.

9. (Previously Presented) The control and regulation system of a combustion unit according to claim 8, wherein said combustion chamber comprises a third fuel inlet duct configured to connect said first fuel distribution valve to an interface between the second area and the third area of the combustion chamber, an air distribution duct configured to connect the first area of the combustion chamber to the third area of the combustion chamber and to be controlled by the second air distribution valve and a main fuel duct connected to the first fuel distribution valve.

10. (Previously Presented) The control and regulation system of a combustion unit according to claim 9, wherein the main fuel duct is connected to the first valve which in turn is connected to the first fuel inlet duct and to the third fuel inlet duct to distribute the fuel in the first area and the second area of the combustion chamber.

11. (Previously Presented) The control and regulation system of a combustion unit according to claim 5, wherein said first set of temperature sensors is positioned between the first area and the second area close to the catalyst.

12. (Previously Presented) The control and regulation system of a combustion

unit according to claim 5, wherein the second set of temperature sensors is positioned close to the catalyst between a second area and the third area of the combustion chamber.

13. (Previously Presented) The control and regulation system of a combustion unit according to claim 5, wherein the third set of temperature sensors is positioned in the third area of the combustion chamber.

14. (Previously Presented) The control and regulation system of a combustion unit according to claim 8, wherein said combustion unit is connected to a compressor and a turbine by the second compressed air inlet duct and by the outlet duct, respectively.

15. (Currently Amended) A control and regulation system of a combustion unit including a combustion chamber and a catalyst, said control and regulation system comprising:

an acquisition device configured to acquire signals proportional to functioning parameters characteristic of the functioning state of the combustion unit;

an electronic data processing unit connected to the signal acquisition device and configured to receive the signals;

a control and regulation program associated with said electronic data processing unit;

a fuel distribution valve configured to fluidly connect to the combustion chamber and regulate an amount of fuel provided to the combustion chamber;

an air distribution valve configured to fluidly connect a first area of the combustion chamber to a third area of the combustion chamber and to regulate an amount of air flowing to the third area from the first area outside the combustion chamber; and

a data base associated with said electronic data processing unit, wherein said electronic data processing unit receives the signals from the signal acquisition device, processes the signals and regulates an opening of the fuel distribution valve and the air distribution valve to minimize polluting emissions of CO and NO_x of the combustion unit based on the received signals and the data base.

16. (Previously Presented) The control and regulation system of a combustion unit according to claim 15, wherein said acquisition device includes a first set of temperature sensors, a second set of temperature sensors and a third set of temperature sensors provided inside the combustion chamber.

17. (Previously Presented) The control and regulation system of a combustion unit according to claim 16, wherein said acquisition device comprises first pressure sensors disposed between a compressor configured to provide air to the combustion chamber and the combustion chamber and second pressure sensors disposed downstream from a turbine connected to the combustion chamber.

18. (Previously Presented) The control and regulation system of a combustion unit according to claim 16, wherein said acquisition device comprises first temperature sensors disposed between a compressor configured to provide air to the combustion chamber and the combustion chamber and second temperature sensors disposed downstream from a turbine connected to the combustion chamber.

19. (Previously Presented) The control and regulation system of a combustion unit according to claim 15, wherein said combustion chamber comprises the first area, a second area in which the catalyst is housed, the third area that sandwiches with the first area the second area, a first fuel inlet duct connecting said first fuel distribution valve to said first area of the combustion chamber, a second inlet duct configured to transport the air coming from a compressor and an outlet duct of the exhaust gases that is connected to the third area of the combustion chamber.

20. (Previously Presented) The control and regulation system of a combustion unit according to claim 19, wherein said combustion chamber comprises a third fuel inlet duct configured to connect said first fuel distribution valve to an interface between the second area and the third area of the combustion chamber, an air distribution duct configured to connect the first area of the combustion chamber to the third area of the combustion chamber and to be controlled by the second air distribution valve and a main fuel duct connected to the first fuel distribution valve.